

Application Number 09/992,708
Amendment dated May 25, 2006
Responsive to Office Action mailed January 25, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): A method comprising:

transmitting a ~~USB~~ universal serial bus (USB) token packet to a first module within a medical device via an internal bus within the medical device;

when the first module has a data packet to transfer, receiving the data packet from the first module via the internal bus; and

transferring the data packet to a second module within the medical device via the internal bus using a USB protocol.

Claim 2 (Currently Amended): The method of claim 1, further comprising encoding the data packet using ~~an NRZI~~ a non return to zero inverted (NRZI) encoding scheme.

Claim 3 (Currently Amended): The method of claim 1, further comprising transferring the data packet in one of an isochronous mode, an interrupt mode, a bulk data transfer mode, and or a control mode.

Claim 4 (Original): The method of claim 1, further comprising, when the first module has no data packet to transfer, receiving an indication that the first module has no data packet to transfer.

Claim 5 (Original): The method of claim 1, further comprising assigning an address to each of the first and second modules.

Claim 6 (Original): The method of claim 1, further comprising associating at least one pipe with each of the first and second modules.

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Claim 7 (Currently Amended): The method of claim 1, wherein the medical device comprises at least one of a therapy control module, a user interface module, ~~and~~ or a patient parameters module.

Claim 8 (Original): The method of claim 1, wherein the medical device comprises a defibrillator.

Claim 9 (Withdrawn): A method for programming a module of a medical device, the method comprising:

transferring program data to the module using a USB protocol; and
storing the program data in a memory associated with the module.

Claim 10 (Withdrawn): The method of claim 9, further comprising encoding the program data using an NRZI encoding scheme.

Claim 11 (Withdrawn): The method of claim 9, further comprising transferring the program data in one of a bulk data transfer mode, an interrupt mode, and an isochronous mode.

Claim 12 (Withdrawn): The method of claim 9, wherein the medical device comprises at least one of a system controller, a therapy control module, a user interface module, and a patient parameters module.

Claim 13 (Withdrawn): The method of claim 12, wherein at least one of the system controller, the therapy control module, the user interface module, and the patient parameters module comprises a serial data interface to transfer data using the USB communication protocol.

Claim 14 (Withdrawn): The method of claim 12, wherein the medical device comprises a defibrillator.

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Claim 15 (Currently Amended): A processor-readable medium containing instructions for causing a processor in a medical device to:

transmit a USB universal serial bus (USB) token packet to a first module within the medical device via an internal bus within the medical device;

when the first module has a data packet to transfer, receive the data packet from the first module via the internal bus; and

transfer the data packet to a second module within the medical device via the internal bus using a USB protocol.

Claim 16 (Currently Amended): The processor-readable medium of claim 15, further containing processor-executable instructions for encoding the data packet using ~~an NRZI~~ a non return to zero inverted (NRZI) encoding scheme.

Claim 17 (Currently Amended): The processor-readable medium of claim 15, further containing processor-executable instructions for transferring the data packet in one of an isochronous mode, an interrupt mode, a bulk data transfer mode, ~~and~~ or a control mode.

Claim 18 (Original): The processor-readable medium of claim 15, further containing processor-executable instructions for, when the first module has no data packet to transfer, receiving an indication that the first module has no data packet to transfer.

Claim 19 (Original): The processor-readable medium of claim 15, further containing processor-executable instructions for assigning an address to each of the first and second modules.

Claim 20 (Original): The processor-readable medium of claim 15, further containing processor-executable instructions for associating at least one pipe with each of the first and second modules.

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Claim 21 (Currently Amended): The processor-readable medium of claim 15, wherein the medical device comprises at least one of a therapy control module, a user interface module, and or a patient parameters module.

Claim 22 (Original): The processor-readable medium of claim 15, wherein the medical device comprises a defibrillator.

Claim 23 (Withdrawn): A processor-readable medium containing instructions for causing a processor in a medical device to:

transfer program data to a module of the medical device system using a USB protocol;
and
store the program data in a memory associated with the module.

Claim 24 (Withdrawn): The processor-readable medium of claim 23, further containing processor-executable instructions for encoding the program data using an NRZI encoding scheme.

Claim 25 (Withdrawn): The processor-readable medium of claim 23, further containing processor-executable instructions for transferring the program data in a bulk data transfer mode.

Claim 26 (Withdrawn): The processor-readable medium of claim 23, wherein the medical device comprises at least one of a system controller, a therapy control module, a user interface module, and a patient parameters module.

Claim 27 (Withdrawn): The processor-readable medium of claim 26, wherein at least one of the system controller, the therapy control module, the user interface module, and the patient parameters module comprises a serial data interface to transfer data using the USB communication protocol.

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Claim 28 (Withdrawn): The processor-readable medium of claim 23, wherein the medical device comprises a defibrillator.

Claim 29 (Currently Amended): A medical device comprising:
a control module within the medical device;
a plurality of functional modules within the medical device; and
an internal bus within the medical device coupled to the ~~system~~ control module and to the plurality of functional modules, the internal bus arranged to transfer data packets between the ~~functional modules and the control module~~ and the functional modules according to a USB universal serial bus (USB) protocol.

Claim 30 (Original): The medical device of claim 29, wherein the plurality of functional modules comprises a therapy control module.

Claim 31 (Currently Amended): The medical device of claim 30, wherein the therapy control module ~~comprises~~ controls delivery of an electric shock to a patient via a defibrillator electrode.

Claim 32 (Original): The medical device of claim 29, wherein the plurality of functional modules comprises a user interface module.

Claim 33 (Currently Amended): The medical device of claim 32, wherein the user interface module is communicatively coupled to at least one of a keyboard, a display screen, a strip chart recorder, an LED arrangement, a rotary encoder device, ~~and~~ or a touch screen.

Claim 34 (Original): The medical device of claim 29, wherein the plurality of functional modules comprises a patient parameters module.

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Claim 35 (Currently Amended): The medical device of claim 34, wherein the patient parameters module is configured to obtain at least one of multi-lead ECG electrocardiogram (ECG) measurements, EEG electroencephalogram (EEG) measurements, vital sign measurements, non-invasive blood pressure (NIBP) measurements, invasive blood pressure measurements, temperature measurements, ~~ETCO₂~~ end-tidal carbon dioxide (ETCO₂) information, ~~and SpO₂~~ or pulse oximetry (SpO₂) information from a patient.

Claim 36 (Previously Presented): The medical device of claim 29, wherein the plurality of functional modules comprises an expansion module to communicate data with at least one device external to the medical device.

Claim 37 (Original): The medical device of claim 36, wherein the expansion module is selected from the group consisting of: a USB-compatible root hub, a hub, a simple device, and a complex device.

Claim 38 (Currently Amended): The medical device of claim 29, wherein the data packets are encoded using ~~an NRZI~~ a non return to zero inverted (NRZI) encoding scheme.

Claim 39 (Currently Amended): The medical device of claim 29, wherein the data packets are transferred in at least one of an isochronous mode, an interrupt mode, a bulk data transfer mode, ~~and~~ or a control mode.

Claim 40 (Currently Amended): The medical device of claim 29, wherein the ~~system~~ control module is configured to assign addresses to the functional modules.

Claim 41 (Currently Amended): The medical device of claim 29, wherein the ~~system~~ control module is configured to associate pipes with the functional modules.

Claim 42 (Original): The medical device of claim 29, wherein the medical device comprises a defibrillator.

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Claim 43 (New): An external defibrillator comprising:

- a medical device enclosure;
- an internal control module within the medical device enclosure;
- a plurality of internal functional modules within the medical device enclosure, wherein the functional modules include at least a therapy control module that controls delivery of an electric shock to a patient via a defibrillator electrode, and a patient parameters module that collects physiological parameter information from the patient; and
- an internal bus within the medical device enclosure coupled to the control module and to the plurality of functional modules, the internal bus arranged to transfer data packets between the control module and the functional modules according to a universal serial bus (USB) protocol.

Claim 44 (New): The external defibrillator of claim 43, wherein the patient parameters module is configured to obtain at least one of an electrocardiogram (ECG), non-invasive blood pressure (NIBP) measurements, end-tidal carbon dioxide (ETCO₂) information, or pulse oximetry (SpO₂) information from a patient.

Claim 45 (New): The external defibrillator of claim 43,

- wherein the plurality of functional modules comprises an expansion module, and
- wherein the control module within the medical device enclosure communicates with an external device outside of the medical device enclosure via the internal bus within medical device enclosure and the expansion module.

Claim 46 (New): The external defibrillator of claim 45, wherein the expansion module comprises a USB-compatible hub.